IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF MISSOURI
EASTERN DIVISION

A.O.A., *et al.*,	)	
	)	
Plaintiffs,	)	
	)	
vs.	)	Case No. 4:11-cv-00044-CDP
	)	(CONSOLIDATED)
THE DOE RUN RESOURCES CORPORATION, *et al.*,	)	
	)	
	)	
Defendants.	)	

PLAINTIFFS' MEMORANDUM OF LAW IN OPPOSITION TO DEFENDANTS' MOTION TO EXCLUDE THE EXPERT OPINIONS OF DR. JILL RYER-POWDER

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Rules

Dr. Jill Ryer-Powder is a board-certified toxicologist with over 30 years of experience in human health risk assessment.[1] She will testify that "there was a complete exposure pathway for lead, arsenic and sulfur dioxide emanating from [Defendants' smelter and refining Complex in La Oroya] to the Plaintiffs during the period that Defendants owned and operated the Complex."[2] Dr. Ryer-Powder will also testify that air emissions from the Complex exposed each cohort Plaintiff to harmful concentrations of lead – which "directly caused or directly contributed to increases in [their] blood lead levels (greater than background levels) that are associated with adverse health effects" – as well as arsenic and sulfur dioxide, which directly increased their risk of cancer and other health problems.[3]

Defendants have moved to completely exclude Dr. Ryer-Powder from the trial of this case.[4] They argue that she is not qualified to offer specific causation opinions and that her general causation opinions are unreliable and, in some instances, irrelevant. They further contend that her opinions about Plaintiffs' exposures to lead needlessly duplicate and "improperly bolster" the opinions of other experts.

These arguments have no merit. Dr. Ryer-Powder has the necessary qualifications to offer all of her opinions. Her conclusions are well supported and based on reliable methods. While she reasonably relies in part on the work of other experts, particularly David MacIntosh and David Sullivan, she will not engage in "improper bolstering" and her testimony will not be needlessly cumulative. The Court should deny Defendants' motion and allow the jury to hear Dr. Ryer-Powder's testimony.

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[1] Doc. 1229-18, 2/18/2019 Expert Report of Dr. Jill Ryer-Powder at pdf pp. 7-8.

[2] *Id.* at pdf p. 48.

[3] *Id.* at pdf p. 49.

[4] *See* Doc. 1211, Defts' Mem. of Law in Support of Ryer-Powder *Daubert* Mot.

I. Factual Background

This case involves massive amounts of toxic air pollution that affected not just the Plaintiffs but whole communities within the vicinity of La Oroya, Peru. It is undisputed that from October 1997 to June 2009, Defendants' Complex emitted lead, sulfur dioxide, and arsenic (among other pollutants) into the air surrounding La Oroya. All three are harmful toxic chemicals that are well known to cause a variety of health problems, particularly in children.

Plaintiffs retained Dr. Ryer-Powder to determine if there was "an exposure pathway" – that is, if any of the lead, arsenic, and sulfur dioxide released into the air from Defendants' Complex during the relevant timeframe migrated to the 16 cohort Plaintiffs' neighborhoods and schools and from there, into their bodies – as well as to offer opinions about the adverse health effects that could result from such exposure.[5] Relying heavily on the detailed exposure assessments performed for Doe Run Peru (DRP) by Integral Consulting, Inc. in 2005 and 2008, as well as air modeling from Plaintiffs' expert meteorologist, David Sullivan, and six blood lead level (BLL) estimates from Plaintiffs' expert industrial hygienist, Dr. David MacIntosh, Dr. Ryer-Powder examined the amounts of lead, sulfur dioxide, and arsenic the cohort Plaintiffs were exposed to because of Defendants' operation of the Complex.

Dr. Ryer-Powder offers four central opinions in this case to a reasonable degree of scientific certainty: (1) "there was a complete pathway of exposure from the release of lead, sulfur dioxide, and arsenic into air from the Complex to the intake of these chemicals by each Plaintiff";[6] (2) Plaintiffs' exposures to lead "directly caused elevated blood lead levels that are

[5] *See* Doc. 1229-18 at pdf pp. 8-12; Exh. 40, 4/5/2019 Deposition of Dr. Jill Ryer-Powder at 51:9-24. All citations to exhibits herein ("Exh.") refer to the exhibits attached to the Declaration of Nathan D. Stump, filed separately.

[6] Doc. 1229-18 at pdf p. 6.

known to produce severe and irreversible adverse health effects";[7] (3) their exposures to sulfur dioxide were at levels that exceeded government-based limits and were sufficient to cause various health problems, including "irritation to the respiratory tract and adverse effects on the lungs";[8] and (4) each Plaintiff's exposure to arsenic "resulted in an increased risk of cancer and an increased risk of damage to the skin, nervous system, and vascular system."[9]

For lead, Dr. Ryer-Powder bases her opinions on her substantial expertise,[10] as well as on the measured BLLs for 11 cohort Plaintiffs and estimated BLLs for 6 cohort Plaintiffs (in cases where BLLs were not measured), all of which exceeded 25 µg/dL [micrograms per deciliter].[11] According to Dr. Ryer-Powder, these elevated BLLs "represent recent exposures, since the half-life of lead in blood is short."[12] To determine how elevated these levels were from the norm, Dr. Ryer-Powder considered two large studies of lead in children, both of which were conducted in other parts of Peru: one in 1999, predating Peru's 2004 leaded gasoline ban, and one in 2009.[13] Those studies allowed Dr. Ryer-Powder to estimate background lead from sources other than Defendants' smelter, including from leaded gasoline.[14] They showed BLLs of 7.1 µg/dL in Lima, Peru, and 9.6 µg/dL in Callao, Peru (before the leaded gasoline ban), as well as a mean

[7] *Id.* at pdf pp. 6-7.

[8] *Id.* at pdf p. 7.

[9] *Id.*; *see also id.* at pdf pp. 48-49.

[10] Dr. Ryer-Powder recently chaired the blood lead reference value (BLRV) working group for the CDC's Lead Exposure and Prevention Advisory Committee. *See* https://www.cdc.gov/mmwr/volumes/70/wr/mm7043a4.htm.

[11] *See* Doc. 1229-18 at pdf p. 20. Plaintiff S.A.C.O. is no longer in the cohort.

[12] *Id.* at pdf pp. 12-13; *see also* Exh. 14, *Human Health Risk Assessment, La Oroya Metallurgical Complex*, Integral Consulting, Inc. (Dec. 2, 2005) ("2005 Integral Rep.") at pdf p. 166 ("Blood lead level is primarily an indicator [of] recent exposure....").

[13] *See* Doc. 1229-18 at pdf pp. 21-22.

[14] *Id.* at pdf p. 22.

BLL of 8.7 µg/dL in Santa Isabel, Peru (after the ban).[15] Dr. Ryer-Powder will testify that Plaintiffs' BLLs were "clearly elevated" relative to these background levels.[16]

In addition to her four central opinions, Dr. Ryer-Powder's testimony will be useful to help the jury understand important toxicology concepts, such as how a low-iron diet can affect the body burden of lead,[17] how arsenic is absorbed into the body,[18] and how chronic exposure to sulfur dioxide effects the lungs.[19] She will also help explain key terms from her field, including central tendency estimates, cancer slope factors, inhalation unit risk, reference doses, exposure point concentrations, cancer risk, and noncancer hazard indices.[20]

II. Legal Standard

For expert testimony to be admissible in the Eighth Circuit, the expert must be qualified to assist the finder of fact, the testimony must be relevant, and the testimony must be reliable or trustworthy in an evidentiary sense. *In re Bair Hugger Forced Air Warming Devices Prod. Liab. Litig.*, 9 F.4th 768, 777 (8th Cir. 2021). Proponents of expert testimony need not demonstrate that the assessments of their experts are correct, and trial courts are not empowered "to determine which of several competing scientific theories has the best provenance." *Kuhn v. Wyeth, Inc.*, 686 F.3d 618, 625 (8th Cir. 2012). Rather, the burden is on the proponent to prove that the expert is qualified, that her methodology is scientifically valid, and that "the reasoning or methodology in question is applied properly to the facts in issue." *Khoday v. Symantec Corp.*, 93 F. Supp. 3d

[15] *Id.*

[16] *Id.* Dr. Ryer-Powder did not attempt to calculate the background lead level in La Oroya or quantify how much of Plaintiffs' elevated BLLs could be attributed to Defendants' smelter as opposed to other sources.

[17] *See id.* at pdf p. 14.

[18] *See id.* at pdf p. 23.

[19] *See id.* at pdf p. 37.

[20] *See id.* at pdf pp. 26-32.

1067, 1076 (D. Minn. 2015), *as amended* (Apr. 15, 2015) (quoting *Marmo v. Tyson Fresh Meats, Inc.*, 457 F.3d 748, 757-58 (8th Cir. 2006)). "Doubts regarding whether an expert's testimony will be useful should generally be resolved in favor of admissibility." *United States v. Finch*, 630 F.3d 1057, 1062 (8th Cir. 2011).

III. Argument

A. Dr. Ryer-Powder is qualified to offer all her opinions.

Defendants begin their challenge by arguing that Dr. Ryer-Powder "should not be permitted to render specific causation opinions."[21] Noting that she is a "toxicologist, not a physician," they assert that she is unqualified to "diagnose Plaintiffs with any health condition or to offer any expert opinions regarding the specific cause of those alleged conditions in any Plaintiff."[22] Defendants further argue that Dr. Ryer-Powder did not perform the requisite differential diagnosis necessary to a specific causation opinion, to rule out other potential causes.[23]

Dr. Ryer-Powder is a general causation expert.[24] Unlike other experts, she was not tasked with diagnosing medical conditions in Plaintiffs and determining their specific cause.[25] Instead, she examined the inherent toxicity and attending health risks of Plaintiffs' exposures to lead, arsenic, and sulfur dioxide emitted from Defendants' smelter while Defendants owned and

[21] Doc. 1211 at 1, 4-6.

[22] *Id.* at 5.

[23] *See id.* at 5-6.

[24] "[C]ausation is divided into two components: general and specific. General causation is whether X *can* cause Y. Specific causation is whether X *did* cause Y." *Dittrich-Bigley v. Gen-Probe, Inc.*, No. 11-1762, 2013 WL 3974107, at *7 (D. Minn. July 31, 2013) (emphasis in original).

[25] *See* Exh. 40, 4/5/2019 Ryer-Powder Dep. at 149:7-9 (not offering any opinions on the topic of specific causation); Exh. 41, 8/19/2020 Rebuttal Deposition of Dr. Jill Ryer-Powder at 17:17-18:17 (same); *id.* at 46:14-47:6 ("I am not saying Plaintiff A, B, or C suffered a health effect or is currently suffering a health effect from their exposure to sulfur dioxide.").

operated it.[26] Assessing those specific exposures, Dr. Ryer-Powder concluded that they were sufficient, standing alone, to cause or contribute to cause a host of adverse health effects and an increased risk of getting cancer. That is a quintessential general causation opinion. *See Junk v. Terminix Int'l Co.*, 628 F.3d 439, 450 (8th Cir. 2010) ("General causation is a showing that the drug or chemical is capable of causing the type of harm from which the plaintiff suffers....").

Defendants complain that Dr. Ryer-Powder's opinions are "often framed in terms of specific causation," but they cite only one example: her opinion that "[e]ach Plaintiff was exposed to concentrations of arsenic that directly resulted in an increased risk of cancer and likelihood of adverse effects to skin, the nervous system, and vascular system."[27] That is a general causation opinion, as it addresses only the health risks associated with the high doses of arsenic to which Plaintiffs were exposed. *See Pilliod v. Monsanto Co.*, 67 Cal. App. 5th 591, 609 (2021) (toxicologist who testified that plaintiffs' exposure to Roundup was "sufficient to increase their risk of contracting non-Hodgkin's lymphoma" was a general causation expert); *Arias v. DynCorp*, 928 F. Supp. 2d 10, 24 (D.D.C. 2013) (opinion that plaintiffs' exposure to defendants' toxic chemical "very likely places them at a significant increased risk for the development of cancers in the future" was a general causation opinion).

Dr. Ryer-Powder is not opining that arsenic *caused* any of the Plaintiffs' injuries. Rather, she will testify that they are at increased risk of developing cancer and other health problems because of the extreme concentrations of arsenic to which they were exposed from Defendants' Complex.[28] That is an opinion that Dr. Ryer-Powder – a trained and experienced toxicologist – is well qualified to give. *See Harris v. CSX Transp., Inc.*, 232 W. Va. 617, 627 (2013) (observing

[26] *See* Doc. 1229-18 at pdf p. 8.

[27] Doc. 1211 at 5 (quoting Doc. 1229-18 at pdf p. 9).

[28] *See* Doc. 1229-18 at pdf pp. 34-35.

that toxicology can address "the increased risk of contracting a disease based upon dosage"); *McClain v. Metabolife Int'l, Inc.*, 401 F.3d 1233, 1244 (11th Cir. 2005) ("Toxicologists ... commonly assess risks posed by drugs, chemicals and other agents."); *cf. Chart v. Town of Parma*, No. 10-6179, 2014 WL 4923166, at *18 (W.D.N.Y. Sept. 30, 2014) (toxicologist could offer opinion that arsenic in the soil posed a cancer risk to children who used the field).

This same analysis holds true for Dr. Ryer-Powder's opinion that Plaintiffs' exposure to lead from Defendants' Complex was "of such a significant degree" that it caused their blood lead levels to increase.[29] Dr. Ryer-Powder does not attempt to quantify that increase for any particular Plaintiff or for the cohort as a whole. She merely opines that the levels of exposure were high enough to raise the concentration of lead in the bloodstream. That is not a specific causation opinion.[30] Even if it were, it is one that Dr. Ryer-Powder is qualified to offer, and there are no valid reasons to exclude it from the trial. *See Marmo*, 457 F.3d at 758 (toxicologists can render specific causation opinions, depending upon "the circumstances of each case"); *Bonner v. ISP Techs., Inc.*, 259 F.3d 924, 928-31 (8th Cir. 2001) (toxicologist permitted to offer specific causation opinion); *Loudermill v. Dow Chem. Co.*, 863 F.2d 566, 569-70 (8th Cir. 1988) (same); *cf. Burton v. Am. Cyanamid*, 362 F. Supp. 3d 588, 601 (E.D. Wis. 2019) (industrial hygienist could testify that lead paint was "the main cause" of each plaintiff's elevated blood lead levels).[31]

[29] *See id.* at pdf pp. 48-49.

[30] *See* Exh. 14, 2005 Integral Rep. at pdf p. 166 (noting "the risk of adverse health effects from lead is [typically] stated in terms of blood lead levels").

[31] Unlike the *Burton* case, Dr. Ryer-Powder was not required to perform any differential etiology to reach this opinion, as she did not attempt to quantify the extent to which each Plaintiff's blood lead levels could be attributed to Defendants' smelter.

B. Prior cases involving Dr. Ryer-Powder are inapposite.

Defendants cite two prior cases in which Dr. Ryer-Powder's opinions were excluded, falsely suggesting that these other courts found some fault with the methods she employed in this case.[32] Neither case sheds any light on how the Court should rule here.[33] Simply because another court excluded Dr. Ryer-Powder's opinion in another context does not mean that her general causation opinions in this case are fundamentally unreliable. Her testimony regarding blood lead levels has been accepted by other courts, including here in Missouri.[34]

C. Dr. Ryer-Powder's general causation methodology is reliable.

Defendants spend ten pages of their brief challenging Dr. Ryer-Powder's methodology for determining general causation, asserting that it is "unreliable" for a host of reasons.[35] But Dr. Ryer-Powder's methodology was reliable: she examined the airborne concentrations of lead, arsenic, and sulfur dioxide emitted from the Defendants' Complex (as calculated by Sullivan), considered the approximate amount of time that each Plaintiff was exposed to those toxic chemicals, and applied her expertise to determine the likely health effects to each Plaintiff from those exposures. There is no valid reason to exclude her general causation opinions.

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[32] *See* Doc. 1211 at 6-7.

[33] In *Diamond X Ranch*, the court granted a motion *in limine* to exclude evidence that some sheep had died after grazing in an allegedly contaminated field, finding the evidence "irrelevant" and "unreliable." *Diamond X Ranch LLC v. Atl. Richfield Co.*, No. 13-00570, 2018 WL 2127734, at *13 (D. Nev. May 8, 2018). Dr. Ryer-Powder was one of several experts who offered specific causation opinions on the matter, and the court held that "neither party's experts" performed the requisite tests to determine why the sheep died. *See id.* at *14 (citing the need for a differential diagnosis). In *C.W. v. Textron, Inc.*, Dr. Ryer-Powder's general causation opinion was excluded because the court found that her opinions about the toxicity of vinyl chloride to newborns were not adequately supported by the scientific literature. *See C.W. v. Textron, Inc.*, No. 10-87, 2014 WL 1047940, at *10 (N.D. Ind. Mar. 17, 2014) ("The problem here is that while Ryer–Powder cites studies ... she doesn't explain why or how those studies apply here[.]"), *aff'd sub nom. C.W. ex rel. Wood v. Textron, Inc.*, 807 F.3d 827 (7th Cir. 2015). Unlike vinyl chloride, the scientific literature on lead, arsenic, and sulfur dioxide is robust and establishes that all three are toxic to humans, even at low dosages. Defendants have not challenged Dr. Ryer-Powder's reliance on any studies concerning the toxicity of these chemicals.

[34] *See Blanks v. Fluor Corp.*, 450 S.W.3d 308, 414 (Mo. Ct. App. 2014).

[35] Doc. 1211 at 6-16.

1. She considered potential alternative sources of lead and arsenic.

Defendants contend that Dr. Ryer-Powder's general causation opinions should be excluded because she "ignores potential alternative sources of lead and arsenic exposure," particularly "the significant historical contamination" in La Oroya due to the operation of their smelter before they purchased it.[36] This line of attack completely misses the mark.

First, Defendants are wrong on the law. The questions addressed by Dr. Ryer-Powder are (1) whether Plaintiffs were exposed to lead, arsenic, and sulfur dioxide from Defendants' Complex; and (2) whether that exposure alone was sufficient to cause adverse health effects.[37] Neither question required her to consider whether Plaintiffs might have also been exposed to lead or arsenic from other sources. Defendants offer no legal or scientific support to exclude Dr. Ryer-Powder's general causation opinion on those grounds because there is none. *See, e.g.*, *In re Flint Water Cases This Ord. Relates To: Bellwether I Cases*, No. 17-10164, 2021 WL 5925190, at *5 (E.D. Mich. Dec. 15, 2021) (plaintiffs' toxicologist was not required to rule out possible other exposures to lead before offering general causation testimony); *Allen v. Am. Cyanamid*, No. 11-0055, 2021 WL 1086245, at *15 (E.D. Wis. Mar. 22, 2021) (doctor's opinion that lead alone caused a specific IQ drop did not require him to perform a differential etiology).

Second, Defendants are wrong on the facts. Even though it was not required, Dr. Ryer-Powder clearly did consider other possible sources of lead and arsenic exposure. With regard to lead, she notes in her report that Integral's 2005 risk assessment discussed "other potential sources of lead exposure in La Oroya, including manufacturing and mineral processing operations other than the Complex, automobile emissions, plumbing in potable water supplies,

[36] *Id.* at 7.

[37] *See* Doc. 1229-18 at pdf p. 8.

lead-based paint, lead solder in cans, lead glazes on clay pottery, and pencils and toys decorated with lead-based paint."[38] She also considered Integral's conclusion that "with the exception of continuing automobile emissions,"[39] these "other sources are not major contributors to lead exposure in La Oroya."[40] For both lead and arsenic, any effects from historic contamination in the soil were dwarfed by the relentless exposure to massive concentrations in the air and settled dust.[41] Dr. Ryer-Powder further considered that Plaintiffs all had measured or modeled BLLs of at least 25 µg/dL,[42] far above background levels, and concluded that the smelter's toxic releases were high enough on their own to cause adverse health effects.[43] Given the facts of this case, that opinion was "hardly a stretch." *Cf. In re Flint Water Cases This Ord. Relates To: Bellwether I Cases*, No. 17-10164, 2021 WL 5847102, at *10 (E.D. Mich. Dec. 9, 2021) ("[I]t is hardly a stretch to conclude that Plaintiffs, who all consumed Flint River water for more than three months, were exposed to enough lead to cause the neurocognitive harms they experienced."); *see also generally McClain*, 401 F.3d at 1239 (holding that "an extensive *Daubert* analysis on the

[38] *Id.* at pdf p. 11 (citing Exh. 14, 2005 Integral Rep. at pdf p. 65).

[39] Dr. Ryer-Powder further considered the likely impact of automobile emissions on blood lead levels in La Oroya by considering a pair of studies that measured BLLs in other communities with significant vehicle traffic. *See* Doc. 1229-18 at pdf pp. 21-22. From these, she concluded that Plaintiffs' measured and estimated blood lead levels were "clearly elevated relative to these background concentrations in areas of Peru." *Id.* at pdf p. 22.

[40] *Id.* at pdf p. 11 (quoting Exh. 14, 2005 Integral Rep. at pdf p. 65).

[41] Integral's 2005 risk assessment, for example, examined "current human health risks ... from air emissions from the Complex." Exh. 14, 2005 Integral Rep. at pdf p. 19. Although "[c]ontributions from historic operations to soil metal concentrations could not be distinguished from impacts of current operations," Integral assumed that "metals in air, outdoor dust, indoor dust and food" were all "principally due to current smelter operations." *Id.* at pdf p. 21. Predictably, the outdoor dust contained "much higher concentrations of lead than ... the underlying soil," *id.* at pdf p. 27, and was the "dominant exposure pathway" for lead for all the surrounding communities. *Id.* at pdf p. 32. Indoor dust and lead-contaminated food were also major sources of lead exposure. *Id.* at pdf p. 169. Integral's findings for arsenic were similar, as "the cancer risk estimates due to incidental ingestion of outdoor dust were generally about ten times higher than corresponding estimates for surface soil." *Id.* at pdf p. 172.

[42] *See* Doc. 1229-18 at pdf p. 20.

[43] *See id.* at pdf pp. 48-49.

general toxicity question" is unnecessary "when the medical community recognizes that the agent causes the type of harm a plaintiff alleges").

Defendants understandably want to point the finger at the smelter's prior owners and raise doubts in the jurors' minds about the extent to which Plaintiffs' injuries might have been caused by exposure to historical emissions, presumably still present in the soil. While this defense is refuted by the Integral findings in 2005 and 2008,[44] Defendants are free to advance it at trial. It is not a valid basis to exclude Dr. Ryer-Powder's opinions. *See In re Nuvaring Prod. Liab. Litig.*, No. 08-MD-1964, 2013 WL 856218, at *5 (E.D. Mo. Mar. 5, 2013) ("Allegations that Plaintiffs' experts 'cherry picked,' or ... ignored unfavorable data, must wait until cross-examination.") (citing *Kuhn*, 686 F.3d at 633).

2. Her method for approximating background BLLs is reliable.

Defendants challenge Dr. Ryer-Powder's reliance on two contemporaneous studies of children in other parts of Peru to approximate background lead levels in La Oroya, because neither one involved a community situated "near a smelter" or "nearby lead-related industries."[45] But Defendants do not identify any other study or explain how it would have better predicted background BLLs in La Oroya. Every study has limitations. Exploring them is the province of cross-examination, not exclusion. *See Kuhn*, 686 F.3d at 632; *In re Celexa & Lexapro Prod. Liab. Litig.*, 927 F. Supp. 2d 758, 764 (E.D. Mo. 2013) (argument that expert did not rely on "the right ... studies" in reaching his opinion was not proper grounds for exclusion).

[44] *See, e.g.*, Exh. 14, 2005 Integral Rep. at pdf p. 61 (lead and sulfur dioxide were released from the Complex "at levels capable of causing health effects"); Exh. 15, *Complementary Human Health Risk Assessment*, Integral Consulting, Inc. (Nov. 21, 2008) ("2008 Integral Rep.") at pdf p. 80 ("[T]he estimated mean contribution from soil ingestion to blood lead level in La Oroya Antigua is 0.5 to 0.75 µg/dL."); *id.* at pdf p. 24 (observing that "[a]s emissions from the Complex are reduced, the residual soil arsenic concentrations from historical operations will come to dominate exposures").

[45] Doc. 1211 at 10.

Defendants' own expert, Dr. Theresa Bowers, employed the same methodology as Dr. Ryer-Powder. She considered five studies – including both studies relied upon by Dr. Ryer-Powder – and concluded that the background lead levels in La Oroya during the relevant period were "no lower than 8 µg/dL."[46] In fact, Dr. Bowers' estimate is *slightly lower* than the background levels suggested both by Dr. Ryer-Powder[47] and by Integral in 2005.[48]

Defendants suggest, without legal support, that Dr. Ryer-Powder's opinion about background lead levels should be excluded because her estimates are higher than those of Dr. MacIntosh.[49] But background levels will vary between studies, which is why scientists present ranges of data and base their conclusions on the weight of the evidence. Defendants "identify no legal authority requiring experts to agree in order to be reliable, and in fact the Advisory Committee's Notes to Rule 702 acknowledge[] that reliable experts may reach different conclusions." *Allen*, 2021 WL 1086245, at *19 (citing Fed. R. Evid. 702, advisory committee's note (2000 amends.)); *see also Aspex Eyewear, Inc. v. E'Lite Optik, Inc.*, No. 98-2996, 2002 WL 1751381, at *31 (N.D. Tex. Apr. 4, 2002) (holding that "an expert witness' opinion is ... not rendered unreliable under *Daubert* merely because another expert for the same party holds an opinion that can be viewed as inconsistent with that conclusion").

3. Her risk assessment opinions are admissible.

Defendants complain that Dr. Ryer-Powder should have relied on "several studies of urinary arsenic in the La Oroya area," because, according to their own expert, "urine arsenic

[46] *See* Doc. 1211-10, 11/26/2019 Expert Report of Dr. Teresa Bowers at pdf pp. 26-30.

[47] *See* Doc. 1229-18 at pdf pp. 21-22 (discussing background levels of 9.9 µg/dL and 8.7 µg/dL).

[48] Exh. 14, 2005 Integral Rep. at pdf p. 109 (estimating a baseline BLL of 9 µg/dL "to represent the current conditions, including ... exposures to lead in soil"). Integral also predicted that future baseline BLLs would decline "as lead emissions from the Complex are reduced." *Id.* Indeed, in its 2008 risk assessment, Integral assumed a baseline BLL of only 4.5 µg/dL. Exh. 15, 2008 Integral Rep. at pdf p. 81.

[49] *See* Doc. 1211 at 10.

levels are more accurate than modeled air levels when assessing Plaintiffs' risks of various health effects."[50] They offer no scientific support for that claim, let alone the kind of overwhelming support that would be required for this Court to find Dr. Ryer-Powder's testimony unreliable. "As long as the expert's scientific testimony rests upon 'good grounds, based on what is known' it should be tested by the adversary process with competing expert testimony and cross-examination, rather than excluded by the court at the outset."[51] *Johnson v. Mead Johnson & Co., LLC*, 754 F.3d 557, 562 (8th Cir. 2014) (quoting *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 596 (1993)); *see also Hill v. Sw. Energy Co.*, 858 F.3d 481, 486 (8th Cir. 2017) ("So long as the methods employed are scientifically valid, mere disagreement with the assumptions and methodology used does not warrant exclusion of expert testimony." (cleaned up) (quoting *SEC v. Das*, 723 F.3d 943, 950 (8th Cir. 2013))); *see also Jordan v. Dominick's Finer Foods*, 115 F. Supp. 3d 950, 963 (N.D. Ill. 2015) ("[O]bjections as to whether an expert considered certain factors that the opposing side deems irrelevant generally go to the weight of the expert's opinion, not its admissibility.").

"The test of admissibility is not whether a particular scientific opinion has the best foundation, or even whether the opinion is supported by the best methodology or unassailable research. Rather, the test is whether the 'particular opinion is based on valid reasoning and reliable methodology.'" *In re TMI Litig.*, 193 F.3d 613, 665 (3d Cir. 1999). "To the extent that Defendant has an expert who bases his opinion on reliable studies supporting a different opinion,

[50] *Id.* at 11 (citing Doc. 1211-11, 11/26/2019 Expert Report of Dr. Barbara Beck at pdf p. 39).

[51] Dr. Ryer-Powder had "good grounds" to use modeled air concentrations instead of urine-based estimates. Urine arsenic levels represent recent exposures; arsenic absorbed by the body is "excreted mainly in the urine at rates as high as 80%." *See* Doc. 1229-18 at pdf p. 23 (quoting information published online in 2019 by the Oak Ridge National Laboratory's Risk Assessment Information System); *accord* Exh. 14, 2005 Integral Rep. at pdf p. 138 ("[M]ost arsenic ... is rapidly excreted in the urine (i.e., greater than 75 percent of the absorbed dose)."). Accordingly, relying on urine arsenic measurements reported in various studies at specific points in time could be a far less reliable method for estimating Plaintiffs' long-term arsenic exposure levels.

the matter is one that 'should be tested by the adversary process – competing expert testimony and active cross-examination – rather than excluded from jurors' scrutiny.'" *Mortimer v. A.O. Smith Corp.*, No. 13-04169, 2015 WL 12533103, at *11 (E.D. Pa. Oct. 23, 2015) (quoting *United States v. Mitchell*, 365 F.3d 215, 244 (3d Cir. 2004)).

Defendants claim that Dr. Ryer-Powder's reliance on the EPA's Regional Screening Level (RSL) for airborne arsenic "renders her opinions inherently unreliable," because "'reliance on regulatory standards ... is an improper basis for an expert opinion.'"[52] But Defendants misread, misleadingly misquote, and misapply the *Textron* opinion. As the court there explained, the issue was not whether it was proper for Dr. Ryer-Powder to rely on regulatory standards to support her opinions, but rather whether such reliance "alone" was enough to establish general causation. *Textron*, 2014 WL 1047940 at *5; *aff'd*, *C.W. ex rel. Wood v. Textron, Inc.*, 807 F.3d 827, 838 (7th Cir. 2015) ("[E]xceedance of government regulation, as we've held before, does not by itself prove causation.").

Here, by contrast, it was entirely appropriate for Dr. Ryer-Powder to consider the EPA's current RSL for arsenic in air when assessing whether the dosages Plaintiffs were exposed to were sufficient to increase their risk of cancer. The RSL provided a scientifically based and reliable benchmark for determining the air concentration of arsenic a person could be exposed to without increasing their risk of cancer above a probability of one in a million. Dr. Ryer-Powder scaled the 26-year RSL to determine the average baseline concentration per year, then applied

[52] Doc. 1211 at 12 (quoting *Textron*, 2014 WL 1047940 at *5); *see also id.* at 12 n.6 ("Her reliance on these regulatory standards also renders [Dr. Ryer-Powder's sulfur dioxide] opinions unreliable and inadmissible.").

that figure to each Plaintiff individually to calculate their cancer risk, based on their specific exposures.[53] That is an acceptable methodology.[54]

Finally, Defendants complain that Dr. Ryer-Powder miscalculated the total cancer risk for the population of La Oroya and relied on an "outdated" model that has been criticized in recent years by other scientists. These sorts of complaints go to the weight of her testimony, not its admissibility. When the expert testimony is "within 'the range where experts might reasonably differ,' the jury, not the trial court, should be the one to 'decide among the conflicting views of different experts.'" *Johnson*, 754 F.3d at 564 (quoting *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 153 (1999)).

4. Her method for estimating Plaintiffs' sulfur dioxide exposures and associated risk of injury is admissible.

Defendants hope to strike Dr. Ryer-Powder's sulfur dioxide opinions by assailing the underlying work of David Sullivan. They claim that his "sulfur dioxide exposure estimates are fatally flawed and unreliable for a variety of reasons" and fault Dr. Ryer-Powder for taking "no steps to verify" his work.[55] Defendants' criticisms of Sullivan's air modeling are insufficient to support a *Daubert* challenge, as explained in Plaintiffs' separately filed response.[56]

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[53] *See* Doc. 1229-18 at pdf pp. 33-34.

[54] It is worth noting that Integral relied on the same information in performing their risk assessments. *See* Exh. 14, 2005 Integral Rep. at pdf p. 85. So did Gradient, the other consulting firm hired by Defendants to perform a similar risk assessment in 2004. *See* Doc. 871-82, *Comparison of Human Health Risks Associated with Lead, Arsenic, Cadmium, and SO2 in La Oroya Antigua, Peru*, Gradient Corp. (Feb. 13, 2004) at pdf pp. 26, 28-29. Indeed, if Dr. Ryer-Powder hadn't considered the RSL, Defendants would likely be challenging her opinion on that basis. *See, e.g.*, *Louderback v. Orkin Exterminating Co.*, 26 F. Supp. 2d 1298, 1305 (D. Kan. 1998) ("[T]he court must decide whether a failure by a toxicological expert to take into account standards such as ... the EPA reference dose in rendering an opinion on causation renders the opinion unreliable under *Daubert*. The FJC Reference Manual and several reported cases suggest that it might.") (citing inter alia *Wright v. Willamette Indus., Inc.*, 91 F.3d 1105 (8th Cir. 1996)).

[55] Doc. 1211 at 14.

[56] *See generally* Pltfs' Resp. to Sullivan *Daubert* Challenge, filed separately.

More pertinent to this motion is whether Dr. Ryer-Powder was permitted to rely on Sullivan's work without taking steps to validate it in some way. Indeed, she was. "Experts – especially laboratory experts – regularly rely on the technical statements and results of other experts to form their own opinions." *Williams v. Illinois*, 567 U.S. 50, 89 (2012) (Breyer, J. concurring). "An expert cannot be an expert in all fields, and it is reasonable to expect that experts will rely on the opinion of experts in other fields as background material for arriving at an opinion." *United States v. 1,014.16 Acres of Land, More or Less, Situate in Vernon Cty., State of Mo.*, 558 F. Supp. 1238, 1242 (W.D. Mo. 1983), *aff'd*, 739 F.2d 1371 (8th Cir. 1984); *see also Farm Bureau Prop. & Cas. Ins. Co. v. CNH Indus. Am. LLC*, No. 16-3122, 2018 WL 2077727, at *10 (N.D. Iowa Feb. 5, 2018) ("[T]here is no rule that experts ... may not rely on the opinions of other qualified experts.").

Defendants also take issue with Dr. Ryer-Powder's reliance on the 1998 toxicological profile for sulfur dioxide, asserting that a more recent publication from the EPA cuts against her opinion and should have been considered. Once again, this is an argument addressed to the factual basis for Dr. Ryer-Powder's opinions, and as such it does not warrant excluding her opinions from the trial. *E.g.*, *Orden v. Schafer*, No. 09-00971, 2015 WL 1286369, at *3 (E.D. Mo. Mar. 20, 2015) (rejecting challenge that experts relied on "outdated" materials, because "the factual bases of the expert opinions are matters of credibility, not admissibility").

5. The supposed errors Defendants cite are not grounds for exclusion.

Defendants conclude their attack on Dr. Ryer-Powder's methodology by complaining that her work is "sloppy and riddled with careless mistakes."[57] They assert that various errors

[57] Doc. 1211 at 15.

"demonstrate without a doubt that [her] methodology is unreliable."[58] Courts in the Eighth Circuit and across the country agree that errors in an expert's reports are not a proper basis for a *Daubert* challenge. *See, e.g.*, *Bader Farms, Inc. v. Monsanto Co.*, No. 16-299, 2019 WL 7019552, at *6 (E.D. Mo. Dec. 20, 2019) (refusing to strike expert report allegedly "riddled with errors," because such "criticisms are appropriately made before a jury"); *Pub. Water Supply Dist. No. 3 of Laclede Cty., Missouri v. City of Lebanon, Missouri*, No. 07-03351, 2011 WL 13180447, at *1 (W.D. Mo. Jan. 10, 2011) (rejecting Daubert challenge based on "inconsistencies and errors" in an expert's report, noting "[t]hese ... are better left for the jury"). Defendants' claim is also undercut by their own expert, Dr. Bowers, who admitted that "the net impact of these errors is small."[59]

D. Dr. Ryer-Powder's opinions about the Plaintiffs' increased risk of cancer and other health problems are admissible.

In addition to her cancer risk estimates, Dr. Ryer-Powder's report describes other adverse health effects commonly associated with chronic exposure to high levels of both arsenic[60] and sulfur dioxide (SO_2).[61] For the latter, she explains that all but two cohort Plaintiffs were exposed to concentrations of SO_2 at their homes that were "within the range where lung function changes in healthy non-asthmatics occur."[62] She also notes the SO_2 exposure levels for many Plaintiffs were sufficient to cause nose-bleeds and respiratory irritation.[63]

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[58] *Id.* at 16.

[59] Doc. 1211-10 at pdf p. 40.

[60] Doc. 1229-18 at pdf p. 22 (mentioning cardiovascular disease and diabetes).

[61] *See id.* at pdf p. 38 (noting that chronic exposure can cause an altered sense of smell, increased susceptibility to respiratory infections, symptoms of chronic bronchitis, and accelerated decline in pulmonary function).

[62] *Id.* at pdf p. 46.

[63] *Id*.

Defendants object to any testimony from Dr. Ryer-Powder on these topics. They specifically challenge any testimony about the Plaintiffs' likelihood of developing "certain non-cancer conditions," arguing that they are irrelevant because Dr. Ryer-Powder cannot show that any Plaintiff is more likely than not to develop any of these conditions.[64] But Plaintiffs will offer Dr. Ryer-Powder's testimony for the limited purpose of establishing the extent and nature of each Plaintiff's *present* injury, which the Missouri Supreme Court has found to be admissible.

It is a "well-settled rule" in Missouri that "a plaintiff is entitled to full compensation for past or present injuries that the plaintiff has shown by a preponderance of the evidence were caused by the defendant." *Swartz v. Gale Webb Transp. Co.*, 215 S.W.3d 127, 130-131 (Mo. banc 2007). That the Plaintiffs' present injuries include this increased risk of future injury is "information the jury should have" in considering how to value their claims. *Swartz*, 215 S.W.3d at 132-33 (quoting *Vitt v. Ryder Truck Rentals, Inc.*, 340 So. 2d 962, 965 (Fla. App. 1977)). This Court recently relied on *Swartz* to admit expert testimony of future medical complications that might arise because of the plaintiff's injuries. *See Post v. Dolgencorp*, No. 19-00171, 2020 WL 3412238, at *3 (E.D. Mo. June 22, 2020).

Defendants' citations[65] are not applicable here. They concern plaintiffs seeking "a monetary award to reimburse the plaintiff for the actual medical costs to treat a secondary injury that has not yet occurred but is a consequence of the original injury." *Post*, 2020 WL 3412238, at *3 (citing *Ball v. Allied Physicians Grp., LLC*, 548 S.W.3d 473, 382 (Mo. Ct. App. 2018)). In that scenario, Missouri courts require the plaintiff to prove that the claimed future damages are "reasonably certain to occur," *id.* (citing *Swartz*, 215 S.W.3d at 130-31), which requires expert

[64] *See* Doc. 1211 at 17-18.

[65] *Elam v. Alcolac, Inc.*, 765 S.W.2d 42, 208 (Mo. Ct. App. 1988); *Thomas v. FAG Bearings Corp.*, 846 F. Supp. 1400, 1408 (W.D. Mo. 1994); *Lesch v. United States*, 612 F.3d 975, 982 (8th Cir. 2010).

testimony quantifying the probability as "greater than fifty percent." *Elam*, 765 S.W.2d at 208; *see also Thomas*, 846 F. Supp. at 1408 (in an action seeking compensation for future damages, evidence of increased risk of cancer is not probative unless plaintiff will "more likely than not develop cancer"); *Lesch*, 612 F.3d at 982 ("'[F]uture damages in a personal injury action are not compensable unless reasonably certain to occur.'" (quoting *Thomas*, 846 F. Supp. at 1408)).

Here, Plaintiffs seek to introduce the evidence of their increased risk of developing cancer and non-cancer conditions to assist the jury in evaluating the nature and severity of their *present* injuries, not to recover the costs of *future* medical bills. Under Missouri law, that testimony should be admitted. *See Swartz*, 215 S.W.3d at 132 (observing that the jury should be allowed to consider "all evidence of past and present injuries, including the increased risk of future injury that those present injuries create").

E. Dr. Ryer-Powder does not engage in impermissible bolstering.

Finally, Defendants argue that Dr. Ryer-Powder's opinions are "needlessly cumulative of and improperly bolster the opinions of other experts."[66] There is nothing wrong with one expert relying on another in forming her conclusions. *See Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd.*, 807 F.3d 1283, 1303 (Fed. Cir. 2015) ("Experts routinely rely upon other experts hired by the party they represent for expertise outside their field.") (internal quotation marks omitted). To the extent Defendants rely on and incorporate their arguments for excluding the opinions of Sullivan and MacIntosh, Plaintiffs incorporate their respective responses here.

"[T]estimony on the same topic by different experts ... is not needlessly cumulative where the experts will testify from different perspectives." *Robson v. Duckpond Ltd*, No. 19-01862, 2021 WL 1222429, at *11 (E.D. Mo. Mar. 31, 2021) (internal marks omitted) (quoting *C.C. v.*

[66] Doc. 1211 at 19.

Suzuki Mfg. of Am. Corp., No. 16-1271, 2018 WL 3861354, at *13 (E.D. Mo. Aug. 14, 2018)). As a toxicologist experienced in performing health risk assessments, Dr. Ryer-Powder will provide a different perspective than Dr. Bellinger, an epidemiologist, and Dr. MacIntosh, an industrial hygienist. *See Suzuki Mfg.*, 2018 WL 3861354, at *13 ("[E]xperts testify from different professional perspectives when they work in different professions."). Some overlap is to be expected and does not warrant exclusion.[67] *See* Fed. R. Evid. 403; *cf. Jackson v. Asplundh Constr. Corp.*, No. 15-00714, 2016 WL 4705603, at *5 (E.D. Mo. Sept. 8, 2016) (finding overlap between experts insufficient to warrant exclusion under Rule 403). If it becomes an issue at trial, the Court can instruct the parties to limit their presentations. *E.g.*, *J.B. by & through Bullock v. Missouri Baptist Hosp. of Sullivan*, No. 16-01394, 2018 WL 746302, at *6 (E.D. Mo. Feb. 7, 2018).

IV. Conclusion

It is an inconvenient truth that Defendants' decision to operate their smelter and refining Complex exposed the local children to copious quantities of toxic chemicals. Testimony about the exposure pathway from the Complex to the children, as well as the way in which these chemicals impact the body, will be an important part of the trial. Dr. Ryer-Powder is a well-qualified, experienced toxicologist who carefully examined the relevant evidence and reached her conclusions using reliable methods. Her general causation opinions – that Plaintiffs were exposed to lead, arsenic, and sulfur dioxide emitted from Defendants' smelter in sufficient concentrations to affect their health – are well-supported and not at all controversial.

Defendants have not advanced any argument that warrants preventing the jury from hearing Dr. Ryer-Powder's opinions. The Court should accordingly deny this motion.

[67] This is especially true here, considering that Defendants have also filed motions to exclude the opinions of Dr. Bellinger and Dr. MacIntosh (along with every other expert Plaintiffs intend to call).

Respectfully submitted,

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